PART 1

PROJECT DETAILS

CONTENTS

PART 1

PROJECT DETAILS

PART 1 **3**

PROJECT DETAILS **3**

1.1 Background to the Project 3

1.1.1 10MLD Capacity TTP at Yelahanka 3

1.2 General Description of Project Area 3

1.3 Description of the work 5

1.4 Scope of Work for TTP 6

1.5 Additional Scope for Civil Works 9

1.6 Treated Effluent Characteristics. 10

1.6.1 10MLD TTP at Yelahanka 10

1.7 Site Conditions 10

1.8 Minimum Design Life 11

1.9 Survey and Geotechnical Data and other tests 11

1.10 Access for Other Contractors 12

1.11 Interface with Other Contracts 12

1.12 Contractor's Bengaluru Site Office 12

PART 1
PROJECT DETAILS

1.1 Background to the Project

1.1.1 10MLD Capacity TTP at Yelahanka

The existing 10MLD Capacity TTP based on IFAS technology at Yelahanka under CWSS Stage IV, Phase I and the plant was commissioned during the year 2003 by the contractor OTV. The project area is located in 3HVQ+CW4, Major Akshay Girish Kumar Rd, Yelahanka Satellite Town, Yelahanka New Town, Bengaluru, Karnataka 56006 and to treat flows received at Yelahanka CMC catchment area and the treated effluent is being pumped to Bangalore International Airport for reuse.

The existing 10MLD capacity TTP is constructed in an area of about 5.2 acres, out of which existing plant occupied area of about 3.7 acres. The treated effluent from the plant is collected in treated sewage outfall chamber from where it is pumped to Bengaluru International airport and other consumers along the airport road.

BWSSB has constructed 10 MLD capacity Tertiary Treatment Plant (TTP) based on Activated sludge and filtration technology process at Yelahanka under CWSS Stage IV Phase I to treat flows received at Yelahanka CMC catchment area. The TSPS of capacity 10MLD has been constructed to pump sewage to Inlet of TTP through 300 mm dia DI pumping. The plant was commissioned during the year 2003.

The Project also includes PLC-SCADA system and all other works contingent there to including design, construction, civil works, supply of mechanical, electrical, interconnecting piping and instrumentation equipment's, erection testing and commissioning. The Google Map showing the location of existing 10MLD capacity TTP is indicated in Figure 1.2 is as presented below.

1.2 General Description of Project Area

Project area is located at the Yelahanka Satellite town adjacent to Allalsandra Lake. The location map of existing 10MLD TTP at Yelahanka is shown in Figure 1.1 with comprehensive map of Sewerage System of Bangalore with the jurisdiction of Hebbal STP Division is also highlighted.

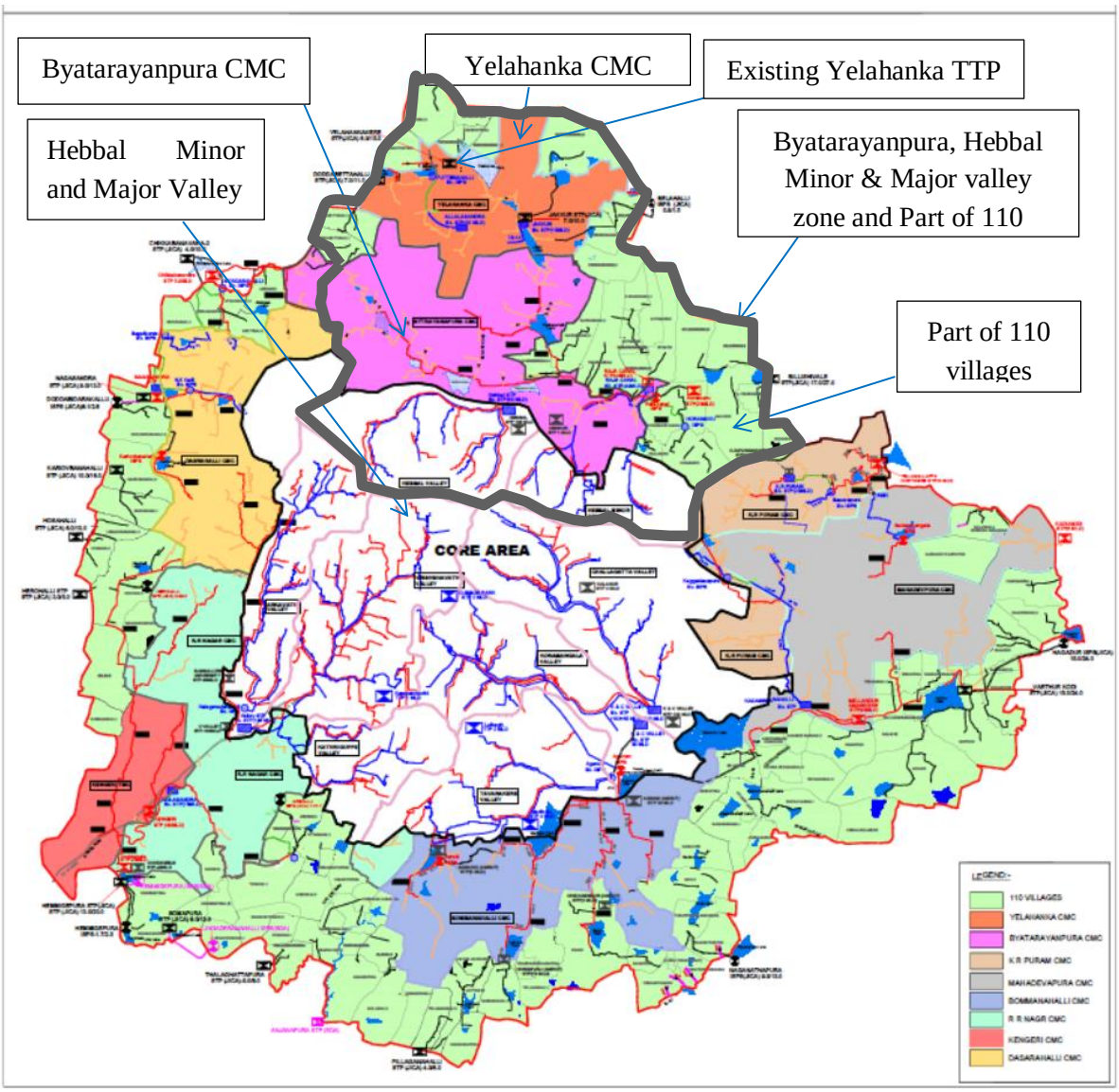
Byatarayanpura CMC
Yelahanka CMC
Existing Yelahanka TTP
Hebbal Minor and Major Valley
Byatarayanpura, Hebbal Minor & Major valley zone and Part of 110
Part of 110 villages
CORE AREA

Figure 1.1: **Location map of Project Area**

The Google Map showing the location of Existing 10MLD TTP at Yelahanka is indicated in Figure 1.2 presented below

Figure 1.2: **Goggle image of Existing 10MLD Capacity TTP at Yelahanka**

1.3 Description of the work

1) The Tertiary Treatment Plant at Yelahanka at Sattelite town shall comprise the following components:

(a) Components and unit processes as described in Volume 2, Section 7, Part 5 (Process Requirements) of these tender documents.

(b) All functional buildings, structures, equipment, and any all other items, accessories, and ancillaries required for proper functioning and operation of the above components and unit processes.

(c) Civil and Building Works for,

- Structures for afore mentioned processes.
- Up-gradation of existing Aeration tank to IFAS tank.

- Construction of New Air Blower Building
- Up-gradation of existing Sludge Handling system to Centrifuge system
- Pipeline Systems and Channels
- Roadways, Curbs, Pavements, Parking Spaces, and associated drainage

(d) Replacement of complete mechanical equipment and system

(e) Complete Electrical equipment and System

(f) Completed Instrumentation, Control and Automation equipment and system

(g) Civil, Mechanical, Electrical, and Instrumentation, Control, and Automation Erection, Installation, Testing, and Commissioning Services

1.4 Scope of Work for TTP

The Scope of Work under this contract includes but is not limited to the following in relation to the design, build (construction) and operation and maintenance of the Works, which are to be implemented.

All preparatory work including clearing and levelling of site, site grading, formation of Finished Ground Level (FGL), construction of internal roads etc., excavation, dewatering, de-silting as required and disposal of all surplus earth, silt and debris from the demolition work to a suitable location by the Contractor at his own cost.

- Site Topographical survey and geotechnical investigation and any other investigation as deemed by the contract conditions.
- Site Clearing, Excavation, Leveling, Grading and Backfilling Activities
- Preparation of process and hydraulic designs with layout, process flow diagram, piping and instrumentation diagram and mass balance and Hydraulic flow diagram of the complete TTP as stipulated in scope for existing units and proposed units.
- Up-gradation of existing Aeration tank to IFAS tank.
- Re-routing of existing internal recycle pipeline from Aeration tank to the upstream of the anoxic tank.
- Construction of New Air Blower building.
- Up-gradation of Existing sludge handling system with centrifuge system.
- Replacement of surface aerators with aspirating type of aerators/mixers in existing equalization tanks.
- In this TTP all the doors, windows, ventilators and handrails to be retained and replaced with same materials wherever required as per contract specification as defined elsewhere in the contract document and as directed by the engineer-in charge.
- Complete rapid sand filters units shall be cleaned and fixed with glazed ceramic tiles.

- Provision of interconnecting pipes for new units and replacement of existing piping system.
- Replacement of complete electromechanical and ICA system.
- Complete Instrumentation, Control, and Automation Equipment and Systems (SCADA)
- Existing Chlorine contact tanks and Treated water tank shall be cleaned thoroughly and painted as directed by the Engineer in charge.
- De-silting of existing equalization tank shall be carried out and silt shall be disposed to a suitable location by the Contractor at his own cost.
- Submission of Detailed engineering designs, drawings, calculations, and data sheets as per requirements of Tender.
- GA Drawings, Unit Process/Equipment/Facility/Building layouts, etc. complete for all proposed units and for all existing process units and buildings to be submitted.
- HAZOP studies.
- All the building like Admin/Lab building, Chlorine room, chemical room, DG room, HT/LT room, sludge handling building, security room, and other civil structure of Treatment Process units etc., to be refurbished with civil repairs, sanitary fittings, internal and external painting etc., in complete.
- All the Walkway Platform, staircase shall be provided with cement concrete chequered tiles of approved (Engineer in charge BWSSB) quality and colour.
- All process units shall be refurbished with civil repairs after dismantling and replacement with brand new equipment. Which shall include internal epoxy painting wherever applicable, internal and external painting.
- The contractor shall ensure to keep the plant in running condition and decommission, dismantling and refurbishment the plant.
- Dismantling and stacking with proper shelter of existing electro mechanical equipment's, ICA equipment/instruments, piping, reinforcement steel etc., safely and handed over to BWSSB.
- During up-gradation if contractor fail to operate the plant and pump treated sewage to existing consumer (Airport, Prestige and other consumers) the revenue out of which shall be recovered from Contractor's running bill.
- The contractor shall submit work plan for each units for dismantling and refurbishment.
- Lab should be upgraded with new Lab equipment's.
- The Contractor to assess the capacity enhancement of power supply and laisoning with KPTCL/BESCOM for additional load of power supply.
- Entire TTP plant lighting luminaries should be replaced.
- Safety procedures for Electrical Equipment's should be taken.

- Detailed sizing, design, and engineering, of all treatment units, buildings, structures, and equipment (including all civil, mechanical, electrical, architectural, instrumentation, control, automation, and SCADA components).
- Safety procedures like Naming and Marking the alignment with Safety boards should be done.
- All existing roads shall be refurbished and new RCC drains to be constructed. New roads and drains as required for proposed new process units and buildings shall be provided.
- Complete plantation and landscaping works to give pleasant environment of build out campus Garden/ Plantation and Landscaping to be maintained and upgraded as required by the Engineer-in charge, BWSSB at all TTP.
- Procurement, supply, installation, erection, testing and commissioning of all mechanical, electrical, instrumentation, PLC/SCADA system complete.
- Execution of all Civil, Mechanical, Electrical, Instrumentation, SCADA Works, bypass lines and other pipelines at Site including Construction, Erection, Testing.
- Submission of Operation and Maintenance Manuals in two parts; one for 2 years during work contract and another for 5 years after work contract.
- No part of the work will be in Employers scope, all the works shall be in scope of the Bidder.
- Design and construction of complete plant water supply and bore well water system including Yield study for Bore wells shall be carried out and to be submitted to Employer's review and approval.
- Plant testing, commissioning, stabilization, demonstration of performance guarantee.
- Providing training services to Employer's personnel including O&M staff.
- Getting required consent and clearances from KSPCB Authority for up-gradation and to operate the plant.
- Preparation and submission of As-Built drawings for all civil, mechanical, electrical, Instrumentation, SCADA works complete.
- Minimum 2 nos. of air conditioner of 2 tonnes capacity shall be provided in SCADA room.
- Real time online monitoring systems at Inlet & outlet of TTP, auto sampler and laboratory equipment's complete.
- Wireless Communication System for remote monitoring of TTP from Central SCADA Station at Shimsha Bhavan / Cauvery Bhavan.
- Trees designated by the Engineer shall be protected from damage during the course of the work and earth level within one meter of each such tree shall not be changed. Where necessary, such trees shall be protected with temporary fencing. All such cost shall be borne by the Contractor
- Tests on Completion, trial run and commissioning.
- Auxiliary systems like CCTV for monitoring of TTP with minimum 12 nos. with 360^0 rotation shall be provided.

- Two (2) years of Operation and Maintenance for TTP during up-gradation and new construction and Five (5) years Operation and Maintenance for TTP in this Contract after successful passing of the Tests on Completion of Design-Build and Issue of the Commissioning Certificate as per the Conditions of Contract given in Volume1 of the Bidding Document.
- O&M period during work contract will not be extended more than 2 years.
- Handing over the facilities after completion of 5 years of O&M with working condition.

Notes:

1) Contractor to submit Unit Process / Equipment / Facility / Building wise Construction Approach and Methodology, prior to start of each/any type of constructional activity at site.
2) It shall be mandatory for Contractor to take prior approval on EMP and EMoP document based on the requirements as specified in Part 18 of the Tender Document.

1.5 Additional Scope for Civil Works

The scope of work for TTP shall include all civil works as per process requirements, including other facilities as listed below.

General points to be noted and implemented for TTP

1. Parking sheds in Steel Structure with RCC foundation pedestal and corrugated MS sheets for roof of not less than 100 Sq. shall be provided.
2. The undulated ground shall be properly graded up to the site FGL for the TTP and other units. Building plinth shall be minimum 450 mm above average finished ground level around building or high flood level whichever is more.
3. HFL provided in this document is for the guidance only. Further the same shall be ascertained during execution by confirmatory Survey and Geotechnical report, as per site requirement and shall get approved from the Engineer in charge.
4. The information provided in this document is only the minimum requirements at the site. The contractor shall visit the site and Bid as per the actual site requirements. No additional claim or variation shall be allowed in case, if there is any change in minimum requirement.
5. The HFL, FGL and EGL provided are to be field verified by the Bidders.
6. 300mm thick Stone soling shall be provided for buildings and structure foundations below PCC for structures coming under water logged areas.
7. Repairing, construction of civil structures after dismantling and fixing of electro mechanical works.
8. Complete rapid sand filters units shall be cleaned and fixed with glazed ceramic tiles.
9. All the building like Admin/Lab building, Chlorine room, chemical room, DG room, HT/LT room, sludge handling building, security room, and other civil structure of Treatment Process units etc., to be refurbished with civil repairs, sanitary fittings, internal and external painting etc., in complete.

10. All the Walkway Platform, staircase shall be provided with cement concrete chequered tiles of approved (Engineer in charge BWSSB) quality and colour
11. Internal painting and external painting to all process units and buildings of 10MLD TTP as specified in the contract shall be done after completion of up-gradation works.
12. All Trees & Vegetation shall be removed after obtaining necessary permissions from the concerned authority and instructions of Engineer in Charge.
13. All existing roads shall be refurbished and new RCC drains to be constructed. New roads and drains as required for proposed new process units and buildings shall be provided.
14. Automatic gate shall be provided at the entrance of Yelahanka TTP as per the direction of Engineer-In-Charge.
15. Rectification of compound wall wherever necessary along with painting of complete existing compound wall as per the direction of Engineer-In-Charge.

1.6 Treated Effluent Characteristics.

1.6.1 10MLD TTP at Yelahanka

The treated effluent characteristic for the TTP shall comply with the following discharge standards given in the Table below:

Parameters	Unit	Value
Treated Effluent Discharge		
pH - Instantaneous range		6.5-9
BOD_5 at 20^0C- Maximum monthly average	mg/L	≤ 5
COD - Maximum monthly average	mg/L	≤ 50
TSS - Maximum monthly average	mg/L	< 5
Total Nitrogen - Maximum monthly average	mg/L	≤ 10
Alkalinity - Minimum instantaneous	mg/L as $CaCO_3$	≥ 70
Total Phosphorus - Maximum monthly average	mg/L	≤ 1
Residual Chlorine - Instantaneous	mg/L	>1
Faecal Coli-form - Maximum monthly average	MPN/100 mL	Nil
Sludge for Disposal		
Maximum VSS/TSS ratio	%	≤ 65
Solid Concentration in Dewatered Sludge	%	≥ 20
Grit for Disposal		
Organic Content in Grit	%	≤ 5

1.7 Site Conditions

The Plant shall be designed and constructed taking into account the following:

Location : Yelahanka satellite town adjacent to Allalsandra Lake

Annual Average Ambient Temperature	:	24° C (Minimum 15°C - Maximum 45° C)
Average Annual Rainfall	:	900 mm
Relative Humidity (maximum)	:	75%
Latitude	:	13° 5.612'N
Longitude	:	77° 35.419'E
Average Altitude	:	RL 839 to RL 962 m above Mean Sea Level (MSL).
Site Conditions	:	Tropical
Total Area	:	5.2 acres out of 3.7 acres

1.8 Minimum Design Life

The Plant components shall be designed and constructed to provide the minimum service life listed below for each component.

Reinforced Concrete Structures	:	60Years
Buried Piping	:	60 Years
Other Civil Structures	:	50 Years
Steel Structures	:	50 Years
Buried Earth Electrode System	:	40 Years
Mechanical Equipment	:	20 Years
Electrical Equipment	:	15 Years
Control Panels	:	15 Years
Instrumentation Systems	:	10 Years
Diffusers	:	7 Years
Computer System	:	7 Years
All type of Server and Computer based Software's	:	Should be updated to latest version

1.9 Survey and Geotechnical Data and other tests

The Employer has the following data available and used these in formulation of the tender elements. They are listed below and shall be used only as guideline. Any use of this report or information contained therein shall be solely at the Contractor's own risk. The Employer accepts no responsibility whatsoever for, nor guarantee, the accuracy, applicability, or completeness of the Report or information contained therein.

- The Employer has got the topographical surveys conducted and also established bench marks along the site. The contour map of Yelahanka TTP are available with BWSSB.

Contractor shall carry out the topographical survey, alignment survey, geotechnical investigation, existing buildings and process units etc. and all other details necessary for proper formulation of his price proposal before submission of tender. After award of contract, Contractor shall carry out independently fresh survey, geotechnical investigation, sewage quality analysis and all other details

necessary for proper planning and detailed design and execution of all works under this contract. The Contractor will be required to provide full details of the survey and geotechnical investigations for site for the approval of the Employer.

1.10 Access for Other Contractors

The Contractor shall allow reasonable access to other Contractors engaged on the Site or on areas adjoining the Site to carry out their work. In the event of a dispute over access or priority between Contractors, the Engineer shall be informed in writing. The Engineer shall inform all parties concerned in writing of his/her decision.

Where any part of the Works is associated with or in physical contact with plant supplied under a separate contract, the Contractor shall satisfy himself that the work carried out by the other Contractor is consistent with the correct operation of the Plant. In the event of the Contractor considering any work being carried out or any work already completed to be detrimental to the ultimate operation of the Plant, he shall report the matter to the Engineer. If the work of the Contractor is delayed because of any acts or omissions of any other contractor, the Contractor shall have no claim against the Employer on that account other than for an extension of time.

1.11 Interface with Other Contracts

The Works under this Contract will physically interface with Works under the respective other contracts. The Contractor of this contract shall co-ordinate with Employer and the Contractor of other contracts as applicable and ensure that all interfaces are designed, constructed, installed, tested, commissioned, operated, and maintained properly to provide a fully functional system meeting all applicable performance requirements.

Available interface information for TTP is provided in Volume 2, Section 7, and Part 5. However, neither the Employer nor the Engineer makes any representation regarding the validity, accuracy, adequacy, or completeness of this information. The Contractor of this contract shall be fully responsible for independently field-verifying any and all information he considers relevant in order to provide a fully functional system.

1.12 Contractor's Bengaluru Site Office

The contractor shall provide general information on the management structure of the design and construction team, and shall make provision for suitably qualified personnel to fill the key positions listed below. The contractor must have qualified employed personnel to fill the following minimum positions. The contractor shall supply information, of the personnel with relevant experience, on a prime experience requirements specified below: candidate and on an alternate for each position; both of whom shall meet the minimum experience requirements specified below: The minimum Design Staff assigned to the Site Office shall be as per Table below and the Office shall include sufficient administrative staff to support the office.

Sl. No.	Position	No. of Position	Minimum Education (Degree Discipline)	Experience (years)		
				Total	In Similar works	As Manager of Similar Works
1	Project/Construction Manager/Contractor Representative	1	M-ENE / Structures	15	8	5
2	Design Manager	1	M- ENE	15	8	5
3	Asst. Construction Manager- Multidisciplinary works	1	BE - Civil	10	6	2
4	Accident Prevention Officer/ Safety officer	1	B-any discipline PGD -ISM	10	2	N/A
5	Senior Surveyor	1	B-S/CE	5	3	N/A
6	Process Engineer	1	MNE or CHE	10	6	N/A
7	Mechanical Engineer	1	M – Mechanical Engineering / Design	10	2	NA
8	Hydraulic Engineer	1	B-CE	10	3	N/A
9	Structural Engineer	1	M- Structures	10	6	NA
10	Electrical Engineer	1	B-Elec	10	2	NA
11	Instrumentation Engineer	1	B-IE	10	3	NA
12	Plant Manager O & M	1	B-ENE	10	5	3

NA: Not applicable. Degree: M = Masters; B = Bachelors; PGD= Post Graduate Diploma; ISM= Industrial Safety Management Discipline: E = General Engineering; CE = Civil Engineering; CHE = Chemical Engineering; ME = Mechanical Engineering; EE = Electrical Engineering; ENE = Environmental Engineering; IE = Instrumentation Engineering; S = Surveying; PHE = Public Health Engineering; SE = Sanitary Engineering. The requisite information shall be furnished as per Application Forms.

Contractor shall designate a Design Manager who is responsible for the complete Works design including preparation of Detailed Designs and obtaining all required Detailed Design approvals. The Contractor shall also designate Design Leads for each design discipline required. The Contractor shall mobilize the entire Design Team to Office in Bengaluru. This design team shall work in coordination with Construction team at Site.

The Design team shall be staffed to facilitate and expedite submittals of Detailed Designs. Contractor shall designate Design Manager who reports directly to the Contractor's Project Manager and will be stationed full-time in the Bengaluru Office through the Detailed Design preparation, submittal and approvals. Contractor shall also designate Design Leads for each design discipline required stationed in the Bengaluru Office who will do design production. The Design Manager will communicate directly with Employer's staff and its designees throughout Detailed Design preparation, submittal,

review and approval, as well as during the same procedures for submittals for testing and commissioning and all other design related submittal required in accordance with the Contract. The Office Staff in conjunction with the Contractor's Home office staff will be responsible for timely response to Employer's comments related to the Detailed Design.

The Contractor's Project Manager will be responsible for the efficient coordination of the Office, Home Office and Employer's staff & its designees such that the design work proceeds expeditiously.

The Contractor shall operate and maintain its Office throughout the Detailed Design preparation, submittal and approval process. Approval of the Detailed Design shall be determined when all submittals have received a review designation of "A-Approved" and final copies of all Detailed Designs have been submitted. Further contractor shall also submit as built drawings for approval after all designs and drawings are approved in code A.

End of Part 1